

"Where's The Analysis?": University Students' Understanding of Critical Thinking

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Abstract: Where there is an emphasis on critical thinking being an essential component learning at University level education, there needs to be a clear focus upon integrating the development of these skills within the curriculum. This paper looks at the importance of critical thinking in higher education and the difficulties that students have in applying critical thinking. Results from a short study show students' understanding of what critical thinking actually means.

Key words: Critical Thinking, Higher Education, University Students

1. Introduction

Critical thinking is an important aspect to higher education in both analysis and reflection as well, enabling students to improve their decision making and problem solving skills. These skills can also increase their employability rate. The marking criteria for higher education assessment places an importance on assessing the degree of critical thinking in many of its components. In spite of this emphasis, many students struggle to think and evaluate in a critical way. Examples of this can be seen in students' dissertations, particularly in literature reviews and analysis studies. Feedback from lecturers often includes the comment: 'not enough analysis'.

The purpose of this research is to look at the relevance of critical thinking in University students. It should be noted that the study does not intend to measure critical thinking in University students, indeed the focus of this paper is to present the results of an evaluation of students' actual understanding of term critical thinking and to what extent they are able to apply critical thinking skills.

2. A Review of Critical Thinking in Higher Education

Dewey (1909, p.9) defines critical thinking as the "active, persistent and careful consideration of a belief or a supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends". Fisher & Scriven, (1997) defines critical thinking as "skilled and active interpretation and evaluation of observations and communications, information and argumentation". However, reflection too plays a vital role in critical thinking process. The thinker validates facts within the existing knowledge pool and beliefs through careful reflections. Further, reflection distinguishes the contextual advantage over the relative ability of two different candidates' critical thinking. Thus, reflection is a key integral part of critical thinking. Hence, we define critical thinking as an '*active, persistent and reflective process of considering believes, analyzing observations and reflecting facts opposed to the existing knowledge pool*'. This definition is contextual for the purpose of measuring the critical thinking ability of university students.

2.1 The Essence of Critical Thinking

Scientific research is the key motive which drives humanity towards truth. The path for truth is often an iterative process, with handful amount of alterations in the existing knowledge pool. Hence,

critical thinking, often involving a high degree of reflective thinking process, regarded as the key to the world of exploration. It is the process through which the unknown becomes known and the tower of knowledge having been constructed using the brick stone of its own remains. Thus, the advancement of knowledge largely depends upon one's ability to think critically. In addition to this, critical thinking is one of the key success factors in any profession. Especially, critical thinking plays a vital role in the fields such as management, law, policy making and political science. It is fundamental that students acquire a high level of critical thinking skills during their tertiary education, which is often looked as the gateway to a professional career. Thus, critical thinking in higher education is a significant area of exploration regardless of the field of specialization a student undertakes. In addition to this, the advancement of knowledge largely depends on the ability to think creatively based on the facts derived from an intense critical thinking. Hence, Fisher (2001, pp. 13) indicates, critico-creative thinking as a means to the advancement of knowledge. This new term clearly distinguish critical thinking from merely being negative. Lloyd & Bahr (2010) argues that there are evidences for differing perceptions among academics and students with regard to what happens in university classrooms, particularly in regard to higher order thinking. However, their study concludes that the academics and students did share substantively similar definitions and understandings of critical thinking.

2.2 Difficulties Students have in Applying Critical Thinking

“Thought process is intertwined with what is being thought about” says Willingham (2007). In this regard, the author argues, that critical thinking is contextual to the situation, but not a generic skill which is prevalence for all sorts of situations. As an example the author shows that a student who reflects on American Revolution from both the British and American perspectives doesn't even think to question how the Germans viewed World War II. Hence the author concludes that “critical thinking is not a set of skills that can be deployed at any time, in any context. It is a type of thought that young children can engage in - and even trained scientists can fail in. The second challenge is that the thinking tends to focus on the surface structure of the problem domain. Especially, this happens due to the fact that we interpret the problems based on what we

already know about the domain. However, a deep knowledge in the domain could possibly eliminate this issue to a certain extent. Hence, teaching students to think critically is all about enabling them to deploy the right type of thinking at the right time.

2.3 Methods for Enhancing Critical Thinking

Early research by Hawkins & Pea (1987) developed a perspective which underlines an approach to creating new technology-based supports for science learning. The study sheds light on the philosophical perspective of science teaching and learning, but lacks to have an interdisciplinary nature. Gokhale (1995) argues there are less researches reported on higher education with regard to the role of collaborative learning in imparting critical thinking. Further, the author argues that collaborative learning is in fact an effective tool for enhancing critical thinking. The study concludes that collaborative learning enhances the critical thinking ability of students. Furthermore, collaborative learning could be effectively utilized for bringing interdisciplinary thinking within the classroom setting. Bissell & Lemons (2006) proposed a new method for assessing critical thinking in the classroom setting. The study focused on how to access critical-thinking skills in an introductory biology course. The study has utilized Blooms taxonomy to develop a process by which (a) questions are prepared with both content and critical thinking skills in mind, (b) grading rubrics are prepared in advance that specify how to evaluate both the content and critical thinking aspects of an answer. The authors conclude that using this methodology has clarified the course goals, improved student meta-cognition and exposed student misconceptions about course content. However, the results could be criticized for its contextual focus on just one discipline, that being biology. Arguably, the critical thinking skills are contextual to specific settings and it is uncommon to expect the same student to apply critical thinking in two different situations. Therefore, the results obtained from a biology classroom cannot be exactly deployed to other disciplines. Also, the above study is completely lacking to include advantage of the collaborative learning in imparting critical thinking of students. Thus, the methodology needs to be deployed in a collaborative leaning environment contextual for specific discipline before it is applied to any specific classroom setting.

3. Method

One hundred and sixty five first year students in their second semester took part in this study. These

students were registered on computing related degrees and participated in the study as part of their learning on a study skills unit. This unit uses a textbook entitled: 'Critical Thinking Skills' [Cottrell, 2005]. The book features a critical thinking test, which aims to establish students' understanding and application of critical thinking. It is the evaluation of the results of this particular test that are presented within this paper. The test uses a Likert scale for responses. Whilst there are other critical thinking skill tests including the Watson Glaser Critical Thinking Appraisal (W-GCTA), that aim to assess the ability to think critically, the purpose of this study was to ascertain students understanding of what exactly critical thinking is and the extent to which they are able to apply these skills.

4. Results

The ability to 'separate key points from other material' is an important skill for students when researching. Being able to distinguish between what is essentially useful information from large amounts of text will enable a more effective use of students' time. Figure 1 indicates that approximately half of the students felt partially inclined to agree. Only 4 out of 165 students considered themselves to be confident in this ability.

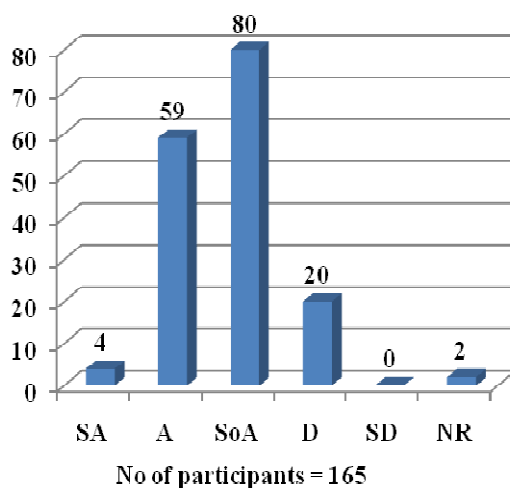


Fig. 1 Students ability to separate key points from other material.

It would be natural for students to be reluctant to criticize the works of renowned academic and indeed, first year University students will unlikely have been exposed to this practice during their secondary education. Many will have some experience of discussions and debates, where they

would have had used critical thinking skills, but this is likely to be the extent of it.

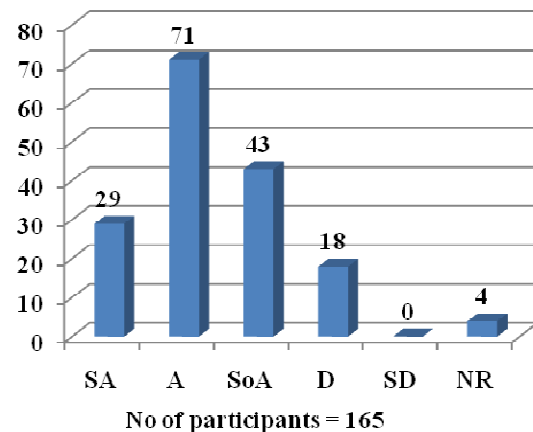


Fig. 2 Feeling comfortable pointing out potential weaknesses in the work of experts

Figure 2 shows the distribution of responses in how comfortable students felt in pointing out potential weaknesses in the work of experts. The majority of students indicated that they were able to criticize the work of experts yet in a subsequent formative feedback session, assessing the same students' literature reviews on a computing related topic, the majority were only to write in an essay style manner and their writing reflected little evidence of deeper thinking.

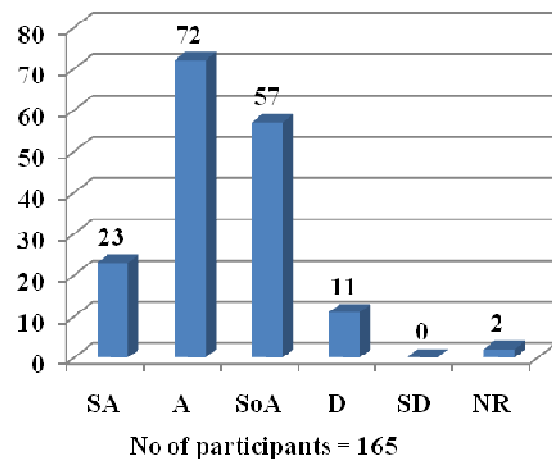


Fig. 3 Students' ability to analyze the structure of an argument

Often in student writing, they tend to simply summarized the content of the source. Looking at the actual structure of an argument from an author's perspective, requires a higher degree of thinking. In writing, students need to be able to compare arguments, as well as using them to support their own arguments. Figure 3 shows that nearly half the

students were not confident in analyzing the structure of an argument.

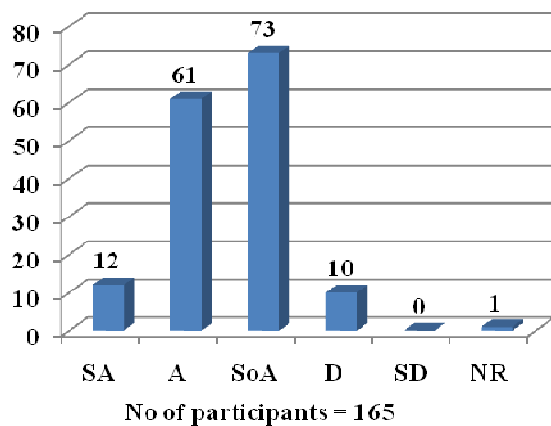


Fig. 4 Students' ability to evaluate the evidence to support a point of view

Similar to the ability that students have in analysis the structure of an argument, is the importance in evaluating the evidence from sources to support a point of view. In presenting a particular view point, students need to look at the literature and evaluate it on a number of factors, including bias, credibility, relevance and timeliness of the research. Furthermore, in presenting the results from a study, it lends credibility to these results if students are placed to place them in context. Figure 4 indicates that approximately half the students were not confident in this exercise.

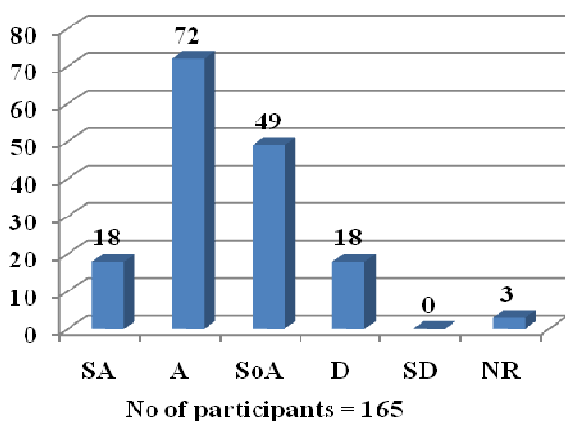


Fig. 5 Students' ability to tell descriptive writing from analytical writing

Descriptive writing is a common issue in student's work. Certainly when students are at the stage of

writing their dissertations, they need to be aware of the difference between descriptive and analytical writing. Where analytical writing involves collating information cohesively, making comparisons and evaluating arguments etc, descriptive writing is merely describing. Figure 5 shows that nearly half the students were unable to tell the difference between these two types of writing. Given that these are first years in their second semester, it may well be that for many of them, their learning so far had little requirement to write beyond essay style level.

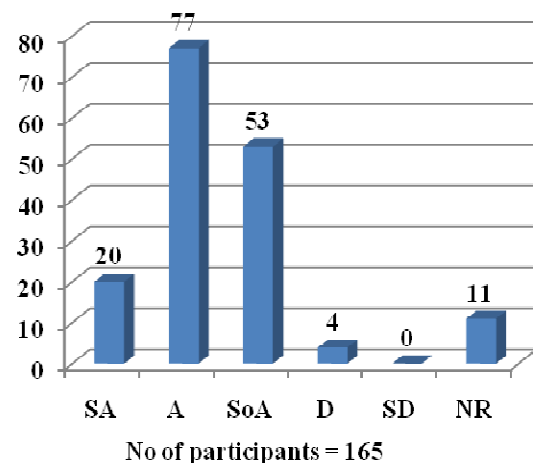


Fig. 6 Students' ability to evaluate source materials.

When students are researching a particular topic, a common problem is failure to evaluate the sources used, beyond that of the relevance of the topic. Students are not always aware of the need to look at factors such: the authority of the research, who conducted it; validity; accuracy; objectivity and currency of the research. Again, figure 6 shows that nearly half the students were not confident in evaluating source materials.

5. Discussion

These results indicate that whilst some students generally feel confident in their understanding of some aspects of critical thinking and how to apply these skills in an academic context, there is a significant portion of students who do not. In fact, almost half the students were unable to express confidence in their understanding of all the factors relating to understanding critical thinking. The limitations of this research however relate to the fact that the study does not actually assess the students' ability to think critically; rather it simply evaluates their actual understanding of critical thinking. Further research will assess critical thinking and

match these results with the results of students' understanding of critical thinking. Furthermore, a comparison of the self assessment of critical thinking will be matched with an assessment of a subsequent literature review, which will be tutor assessed.

Based upon the results of this study, the following recommendations are made:

- An emphasis on developing critical thinking skills should commence early on in higher education
- Explanations on the relevance of critical thinking and how these skills increase employability ratings should be emphasized.
- Examining examples of students work in relation to both analytical and descriptive writing should be encouraged so that students can compare the differences.
- Developing an understanding on how to evaluate sources should be encouraged.
- Consider critical thinking exercises such as comparing arguments, to be achieved collaboratively, ie with other students in a group exercise.

The ability to think critically is paramount in higher education and is essentially a critical life skill, particularly in playing a significant part in

students' later professional lives. Whilst the skill is fundamental to students learning, it needs to be incorporated into the curriculum. This paper's intention is to provide some guidance into how this can be achieved.

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